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TITLE: NSAIDs and the Osteogenic Response to Mechanical Stress in Premenopausal Women

PRINCIPAL INVESTIGATOR: Wendy M. Kohrt, Ph.D.
Robert S. Schwartz, M.D.

CONTRACTING ORGANIZATION: University of Colorado Health Sciences Center
Denver, Colorado 80045-0508

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6. AUTHOR(S)
Wendy M. Kohrt, Ph.D.
Robert S. Schwartz, M.D.

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
University of Colorado Health Sciences Center
Denver, Colorado 80045-0508

E-Mail: wendy.kohrt@uchsc.edu

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13. ABSTRACT ***(Maximum 200 Words)***

This is a study of the effects of ibuprofen, a non-steroidal anti-inflammatory drug (NSAID), on the osteogenic response to 9 months of exercise training in healthy, premenopausal women, aged 21 to 40 years (N=102). The hypotheses are:

- $H1_a$: taking short-acting NSAIDs **before** exercise will **diminish increases in bone mineral density (BMD)** in response to exercise training
- $H1_b$: taking short-acting NSAIDs **after** exercise will **not diminish the increases in BMD** in response to exercise training

Participants take either ibuprofen (400 mg) or placebo capsules before and after each exercise session. Women are randomized to three treatment arms: 1) NSAID before exercise, placebo after exercise (NSAID/placebo; n=34); 2) placebo before exercise, NSAID after exercise (placebo/NSAID; n=34); and 3) placebo before exercise, placebo after exercise (placebo/placebo; n=34). Fifteen subjects have completed baseline testing and are currently enrolled in the study. Twenty-one subjects are presently scheduled for or are undergoing baseline testing. These studies could lead to the development of new strategies to reduce the incidence of, and treatment for, stress fractures that occur in response to vigorous physical activity.

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INTRODUCTION:

The primary aim of this randomized, double-blinded, placebo-controlled trial is to determine the effects of NSAID (ibuprofen) use on the osteogenic response to 9 months of exercise training in 102 premenopausal women. The scientific rationale for this study centers on the knowledge that the osteogenic response to mechanical stress is a prostaglandin (PG)-dependent process and that NSAIDs inhibit PG synthesis. There is evidence that regular NSAID use inhibits the normal bone formation response to mechanical loading, increases risk of fracture, and impairs bone healing. The approved statement of work for this project includes 4 years of recruiting, testing and training subjects as well as completing sample assays, data analyses, and manuscripts.

BODY:

The major objectives for year 1 were to start enrollment and perform tests and procedures on each participant as outlined in the protocol. Table 1 is a presentation of the projected and actual enrollment for the first year of the study. Although the date of award was September 20, 2001, there was a stipulation that work could not commence until the IRB and HSRRB review and approval processes were completed. The fully executed agreement was signed on January 31, 2002. Therefore, the expected and actual progression displayed in Table 1 is based on a January 31 start date (i.e., month 1 is February 2002).

The progression of this study is largely determined by the rate of enrollment of subjects and their completion of the intervention. As shown in Table 1, the number of subjects enrolled in the study has been in line with what was projected in the approved Statement Of Work. There are currently 15 subjects enrolled and 21 subjects scheduled for orientations or in various stages of baseline testing. Based on the anticipated enrollment dates for these subjects, the project will be on or ahead of schedule for the next several months.

KEY RESEARCH ACCOMPLISHMENTS:

Consistent with the Statement Of Work, data analyses have not yet begun. Therefore, there are no study results to report. The key accomplishments-to-date have been recruiting, enrolling, and testing subjects. Various methods have been employed to recruit potential study participants (see Table 2). There have been 193 phone screenings that resulted in 45 scheduled orientations. The ethnicity and race breakdown of the enrolled participants is presented in Table 3. We have been successful in recruiting and enrolling participants of minority race and/or ethnicity and will continue to actively recruit these populations.

REPORTABLE OUTCOMES:

The results and outcomes of this research are not yet available.

CONCLUSIONS:

Conclusions cannot yet be made.

REFERENCES:

Not applicable.

APPENDIX 1: Tables

TABLE 1. Year one projected and actual enrollment

	Month											
	1*	2	3	4	5	6	7	8	9	10	11	12
Projected			1-3	4-6	7-9	10-12	13-15	16-18	18-21	22-24	25-27	28-30
Actual			0	0	7	14	14	15	***22***	***34***	***36***	***36***

* Month 1 is February 2002
The bold italicized numbers are predictions based on current participants in screening and scheduled for orientations.

TABLE 2. Recruitment efforts

Recruiting Media	Number of Phone Screens	Number of Orientations*
Fliers	61	11
Newspaper Ad	68	14
Mass Email	49	17
Word of Mouth	15	3
TOTAL	193	45

*Includes 17 orientations that have been scheduled but not yet completed.

TABLE 3. Actual and target enrollment by ethnicity and race

Race Category	Actual Enrollment	% Total	Target Enrollment	% Total
American Indian/ Alaskan Native	0	0	1	1
Asian	0	0	3	3
Native Hawaiian/Other Pacific Islander	0	0	0	0
Black/African American	1	7	6	6
White	12	80	92	90
Other	2	13	0	0
TOTAL	**15**		**102**	

Ethnic Category	Actual Enrollment	% Total	Target Enrollment	% Total
Hispanic	5	33	20	20
Non-Hispanic	10	67	82	80
TOTAL	**15**		**102**	